

REMARKS/ARGUMENTS

In response to the Office Action dated May 6, 2010, claims 1-3, 5, 7-15, 18-21, 31-35, 38-45, 47, and 49-54 are presented for examination, of which claims 1, 13, 31, 34, and 43 are independent. Reconsideration and further examination are respectfully requested.

Allowable Subject Matter

The Applicants note with appreciation the Examiner's indication that claims 34, 35 and 38-42 remain allowed and that claims 2, 9-12, 14, 19-21, 44 and 51-54 would be allowable if rewritten into independent form. In view of the present amendments and the remarks below, the Applicants respectfully submit that each pending claim is in condition for allowance.

Rejections under 35 U.S.C. § 101

Claims 43-45, 47 and 49-54 are rejected under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter. By the present Amendment, as suggested by the Examiner, "non-transitory" has been added to preambles associated with each of the rejected claims. Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103(a) over Frishman in view of Lee

Claims 1, 3, 5, 7, 8, 13, 15, 31, 32, 43, 45, 47, 49 and 50 are rejected under 35 U.S.C. § 103(a) for allegedly being unpatentable over U.S. Publication No. 2003/0044080 ("Frishman") in view of U.S. Patent No. 6,539,060 ("Lee"). The Applicants respectfully traverse this art grounds of rejection.

Frishman is directed to a method for reducing blocking artifacts in moving and/or still pictures, whereby a group of pixels (referred to as a Region of Interest or ROI) near a boundary between blocks (e.g., Frishman, Abstract). As will be appreciated, a 'block' of pixels relates to a pixel-grouping in accordance with a given compression scheme. Whether a block is 'subdivided' relates to whether the block is reduced in size from a larger block size (i.e., a single 16x16 block can be subdivided into 4 separate 8x8 blocks, etc.). In Frishman, the Examiner reads the claimed "blocks of pixels" upon "the 8 x 8 blocks of pixels in fig. 2" (e.g., see Page 5 of the Office Action).

The Examiner indicates that the claim language of “determining whether the two neighboring blocks are both subdivided” is allegedly taught by Frishman with respect to the Threshold_1 comparison. However, this comparison is only used to detect whether two pixels being compared bound different types of content in a picture. For example, “[i]f the absolute gray-level difference of two adjacent pixels is larger than Threshold_1, then those two adjacent pixels are considered not similar, hence implying the presence of an edge in the picture content” (e.g., [0052] of Frishman).

These Threshold_1 comparisons are applied to a series of pixels in a given line so as to define a Region of Interest (ROI), whereby the ROI is ‘closed’ on both sides by edge-pixels, or pixels whose grayscale values exceed Threshold_1 (e.g., see FIG. 4 and [0053]-[0059] of Frishman). The size of the ROI is then used to select between two filters in [0059] of Frishman, whereby “if the length of the filtered pixels ROI is exactly 8 pixels, then the filter to be used in filtering stage 156 is a 9 Taps FIR filter labeled Filter_1” and “if the length of the filtered pixels ROI is less than 8 pixels, then the filter to be used in filtering stage 156 is a 5 Taps FIR filter labeled Filter_2” (e.g., [0059] of Frishman).

The Applicants remind the Examiner that the Examiner is reading the claimed “two blocks of pixels” upon the 8x8 blocks shown in FIG. 2 of Frishman, each of which has 64 pixels. The ROIs range in size up to 8 pixels, with a different filter used for an 8-pixel ROI as compared to an ROI with fewer than 8 pixels. As will be appreciated, even the largest ROI is much smaller than the full block-size, such that any ROI is a subset or subdivision of the full block.

At a high-level, claim 1 for example is directed to implementing a first deblocking filter for non-subdivided neighboring blocks and implementing a second deblocking filter for neighboring blocks including at least one subdivided block. The Applicants have shown that any ROI (up to 8 pixels in length) is a subdivision of the larger blocks (8 x 8 or 64 pixels in length). Accordingly, the ROI’s length being 8 pixels or fewer does not distinguish the ROI as being subdivided or non-subdivided. In other words, the Examiner’s attempt to characterize an ROI of 8 pixels as corresponding to a non-subdivided block appears to be incorrect. An ROI of 8 pixels is obviously larger than an ROI of 7 pixels, for example, but even an ROI of 8 pixels is a much smaller subset of the block of 64 pixels.

Thus, Frishman does not disclose or suggest “using a first deblocking filter on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is

subdivided” as recited in independent claim 1 and similarly recited in independent claims 13, 31, 34, and 43, because all ROIs appear to be subdivisions of the 8 x 8 blocks. For similar reasons, Frishman does not disclose or suggest “using the second deblocking filter on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks is subdivided” as recited in independent claim 1 and similarly recited in independent claims 13, 31, 34, and 43.

The Applicants further point out that the ROIs themselves cannot correspond to the claimed “two blocks of pixels” as claimed because whether or not ROIs neighbor each other is not described as a factor of any particular relevance in Frishman.

The Applicants further agree with the Examiner with regard to the additional deficiencies of Frishman as set forth at the top of Page 6 of the Office Action. The Examiner cites to Lee as allegedly curing the above-noted deficiencies.

However, while Lee discloses deblocking filtering of block boundary pixels, Lee also makes no mention of block subdivisions. Rather, Lee is simply directed to comparing edge pixels to selectively filter the edge pixels. The size of the blocks (e.g., 8x8, etc.) forming the boundary at which the edge pixels are located, and/or their status as subdivided blocks or non-subdivided blocks, does not appear to factor into the filtering decision in Lee (e.g., see Col. 9, line 53 to Col. 10, line 10 of Lee). Accordingly, Lee cannot cure the suggestion and disclose deficiencies of Frishman as set forth above with respect to independent claims 1, 13, 31, 34, and 43.

As such, claims 2-3, 5, 7-12, 14-15, 18-21, 32-33, 35, 38-42, 44-45, 47, and 49-54, dependent upon independent claims 1, 13, 31, 34, and 43, respectively, are likewise allowable over the combination of Frishman in view of Lee at least for the reasons given above with respect to the independent claims.

The Applicants respectfully request that the Examiner withdraw this art grounds of rejection.

Rejections under 35 U.S.C. § 103(a) over Frishman in view of Lee in view of Thyagarajan

Claim 33 is rejected under 35 U.S.C. § 103(a) for allegedly being unpatentable over U.S. Publication No. 2003/0044080 (“Frishman”) in view of U.S. Patent No. 6,539,060 (“Lee”) in further view of U.S. Patent No. 6,529,634 (“Thyagarajan”). The Applicants respectfully traverse this art grounds of rejection.

As an initial matter, the Applicants agree with the Examiner with regard to the deficiencies of Frishman and Lee specific to dependent claim 33. The Examiner cites to Thyagarajan as allegedly curing the above-noted deficiencies of Frishman and Lee. Even assuming that the Examiner is correct with respect to the teachings of Thyagarajan that are specific to dependent claim 33 (which the Applicants do not admit), the Applicants respectfully submit that Thyagarajan, as presently applied by the Examiner, fails to cure the suggestion and disclosure deficiencies of Frishman and Lee as discussed above with respect to independent claim 31.

As such, claim 33, dependent upon independent claim 31, is likewise allowable over Frishman in view of Lee in further view of Thyagarajan at least by virtue of their dependence upon the independent claims.

The Applicants respectfully request that the Examiner withdraw this art grounds of rejection.

CONCLUSION

In light of the remarks and/or amendments contained herein, Applicants submit that the application is in condition for allowance, for which early action is requested.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

Respectfully submitted,

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